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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

Project	Date	Author

TITLE

REVIEW OF THE 1939-40 INSECT CONTROL PROJECTS
LAGUNAS, PIMA VALLEY AND SANTA CATALINA UNITS
CLEVELAND NATIONAL FOREST

240 W Prospect Rd
Fort Collins CO 80526

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by
S.T. Carlson
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SUBJECT—

INDEX NO.—

REVIEW OF THE 1939-40 INSECT CONTROL PROJECTS LAGUNAS, PINE VALLEY AND CORTE MADERA UNITS CLEVELAND NATIONAL FOREST

A survey of the forest insect conditions on the Cleveland National Forest was made by the Forest Insect Laboratory in November, 1939 (1). At this time infestation conditions in the Julian Lagunas, Pine Valley, Corte Madera, and Palomar Infestation Units were of sufficient importance to warrant direct control recommendations. Funds to facilitate U.S.F.S. CCC control work were allotted for the Lagunas, Pine Valley, and Corte Madera Units which was carried out from December, 1939, to March, 1940 (See Map, Appendix). The project was reviewed while in progress by Salman and Carlson (2) in February, 1940, and again after completion by Miller and Carlson in April, 1940.

INFESTATION CONDITIONS

The pine engraver beetle (Ips oregoni) the western pine beetle (Dendroctonus brevicomis), and the California flathead (Melanophila californica) are the principal insects in the coulter pine infestations. The pine engraver beetle (Ips oregoni), and the California flathead (Melanophila californica) are the insects infesting the jeffrey pine. Survey and control records for the past 15 years show that the California flathead and the pine engraver beetles have caused the most serious losses in both Coulter and jeffrey pines. The western pine beetle was moderately active in 1930, 1933, and 1934, but has entirely disappeared in the Lagunas area in 1938, 1939, and 1940. The jeffrey pine beetle, (Dendroctonus jeffreyi) has been rarely found in the Lagunas area. The last known instance was observed by Miller in 1930 in the Corte Madera Unit some 10 or 15 miles airline southwest of the Lagunas area.

Keen made an examination of the Lagunasarea in 1925 and recommended control by the peeling and burning method. His report in part reads: "Groups of from two to eight small medium-sized trees have been killed in the last few years throughout the area. The killing is principally the work of the flathead borer (Melanophila californica); although a few small trees have been killed by the engraver beetle (Ips oregoni). It is evident that the flathead borer has been working rather slowly, killing only one or two trees in a group each year and continuing in the same locality until the group has become conspicuous with the old trees representing several years' loss."

The flathead infestations are centered in the poorer types of pine stand with losses occurring in single trees or 3 to 8 tree groups of young immature trees (Photo, No.4). Examination of the remaining trees where group infestations occur show that nearly all of the trees of poor appearance contain incipient broods of the California flathead - a species of

Matsucoccus scale was found on several of the trees in these groups by Miller and the writer on April 18, 1940. Mistletoe infections appear to have been responsible for killing of many twigs and branches in trees thus reducing their vigor. Recurring losses in these centers have continued annually now for a period of over 15 years and have resulted in large openings in the forest. Abnormal depletion of the stands in developed areas such as picnic and campgrounds, resort sites, and summer home development areas is keenly felt, and should it continue at the present rate will seriously affect the use of this area for recreational purposes which are considered to be very high.

STAND CONDITIONS

The Lagunas area is probably the most valuable area of the three units where control work was done this year. Its proximity to metropolitan and rural populations has dedicated its use for recreational purposes. The stand is parklike, of mixed age classes, composed mainly of jeffrey pine with some Coulter pine occurring on the brushy, exposed ridges, mostly at the edges of the timbered area. The type can be segregated into two groups, one of pure pine, and the other a mixture of pine and black oak. The losses from insects are greatest in the pure pine-stand group. A large portion of the pure pine stands have an unhealthy appearance, thin, stunted, yellowish foliage, and are heavily infected with mistletoe (Photos 3 and 4). The flathead infestations have been centered to a large extent in the trees making up this type of stand.

During the recent examinations of the area, 26 jeffrey pine trees were selected in areas where flathead and ips infestations have been active for a number of years (Photos 1 and 3). The condition of each tree as to general appearance, foliage, crown length and width, etc., was recorded. It is intended that periodical examinations will be made to record any change so that the improvement or depletion of individual trees can be determined. It would also be desirable in future control to secure more data on trees killed by insects, as the natural factors involved with the character and behavior of this peculiar type of infestation should be determined as a basis for future management plans.

1939-1940 CONTROL

Control work this year was carried out by the cut-peel-burn method and resulted in a very thorough treatment of infested trees. Checking of the area by Ranger Stephensen, Foreman Clark, Senior Entomologist Miller, and the writer on April 13, 14, 15, and 16, 1940, did not reveal any trees that contained flathead broods that would emerge this year. Spotting for the control was good, considering that many of the trees show slight evidence of current brood through fading foliage or woodpecker work in the bark

until late in the season. The control data is as follows:

UNIT	AREA (acres)	NO. TREES TREATED
Corte Madera	2,691	36
Pine Valley	1,793	5
Lagunas Mountain	14,649	363
Totals	19,133	404*

* This is amount treated by government crews only; a limited amount of control by private interests was done in these areas.

REVIEW OF CONTROL WORK, LAGUNAS AREA

Available records show that the first attempt at insect control work in this area was done in 1931 by Ranger Stephensen. Since that time, with the exception of 1932 and 1936, control work has been done annually.

Control data for the Lagunas Area:

YEAR	NO. TREES TREATED		AREA COVERED
1931	152 trees	100 poles	----- acres
1933-34	1,495 " *	0 "	2,055 "
1934-35	511 "	0 "	1,370 "
1937	133 "	0 "	1,350 "
1938	705 "	0 "	12,910 "
1939	444 "	0 "	13,350 "
1940	363 "	0 "	14,649 "

*Includes Pine Valley.

The above control data shows that varying amounts of the infestation were treated since the first project started and that since 1938 when the entire area and infestation was treated there has been a gradual reduction in the amount of infestation.

CHARACTER OF INFESTATION 1935 to 1940

An analysis of tree records from control data for the past three years shows that a majority of the losses from flatheads and other insects have been in groups of trees in immature stands. Survey reports (Keen, 1936; Salman, 1930-31; Patterson, 1935, 36, & 37; Patterson & Carlson, 1938) show that infestations have been centered for a long time in immature stands and in local centers. Data for individual trees is available for the 1938-39-40 control projects; data from control reports together with tree tag data show diameter class losses and loss from insects as follows:

TREE LOSSES BY DIAMETER CLASSES AND INSECTS RESPONSIBLE
CONTROL 1935-37-38-39-40

YEAR	DIA.CLASS INS.	NO.TREES	NUMBER OF TREES KILLED BY INSECTS					
			FLATHEADS	IPS	D.b.	FLATHEAD-IPS	IPS-D.b.	UNKNOWN
1935	No data	511	122	307	1	81	0	0
1936	No control	0	0	0	0	0	0	0
1937	No data	133	46	67	10	0	10	0
1938	1-10	398	254	121	0	3	0	20
	11-20	203	129	66	0	0	0	8
	21-30	22	17	2	0	0	0	3
	31-40	9	6	2	0	0	0	1
	41-50	2	1	0	0	1	0	0
Total, 1938		634	407	191	0	4	0	32
1939	1-10	224	167	56	0	0	0	1
	11-20	139	112	26	0	0	0	1
	21-30	34	30	2	0	2	0	0
	31-40	29	29	0	0	0	0	0
	41-50	9	9	0	0	0	0	0
	51-60	3	3	0	0	0	0	0
Total, 1939		438	350	84	0	2	0	2
1940	1-10	129	128	1	0	0	0	0
	11-20	151	148	1	0	1	0	1
	21-30	33	33	0	0	0	0	0
	31-40	23	23	0	0	0	0	0
	41-50	16	16	0	0	0	0	0
	51-60	4	4	0	0	0	0	0
Total, 1940		356	352	2	0	1	0	1
TOTAL		2,072	1,277	651	11	88	10	35
PERCENT OF TOTAL			61.63	31.42	0.53	4.25	0.48	1.69

FUTURE CONTROL POLICY

The reduction of insect infestations by indirect control methods may offer a more satisfactory solution of the protection problem in this area. Thinning and sanitation clearing have been suggested as a method for improving stand conditions and thereby making them more resistant to insect attacks. It has been observed that in areas surrounding developments and in fire breaks where trees have been thinned and limbed and undergrowth removed, immature stands appear to be greatly improved and losses have been very light. Thinning, however, would be expensive and somewhat out of line in the management of vegetation on recreational areas.

Control by direct methods, which would consist of treating the weakened trees that are infested by flathead larvae, over a period of years would accomplish somewhat the same results. Consistent control the past three years reduced insect losses on the area from 705 trees in 1938 to 363 trees in 1940.

Since the Lagunas Unit is isolated from other pine areas by brushy type the chances of infestation from outside sources are somewhat remote. It is felt that if rigid control was practiced consistently for several years the present losses can be reduced to a few trees annually. With the control work carried on the past few years, the ground has been laid for a test of this method, and continuation of the program for several years more is desirable as an experiment.

An insect control project was undertaken by the U. S. Forest Service in the Lagunas, Pine Valley, and Corte Madera Infestation Units, Cleveland National Forest during the winter of 1939-40. Control was directed at reducing losses from infestation in jeffrey and Coulter pines by the California Flathead (Melanophila californica). The Lagunas Unit, a recreational area, is the largest and most valuable of the three units where insect control was undertaken. This area, since forest insect surveys were first made in 1925, has suffered consistent group losses of immature pine from the California Flathead. Losses from the western pine beetle and pine engraver beetle have been sharply reduced during the past three years, the western pine beetle having entirely disappeared during that time. Flathead losses, though reduced, continue to menace the stands in the area. The stands supporting the infestation appear to be in poor condition and are heavily infected with mistletoe, and infested to an unknown extent with a branch scale, Matsucoccus specie and incipient flatheads. It is felt that the problem of reducing insect losses from the flathead does not lie wholly in control but that there are other underlying factors that lead up to the ultimate killing of the trees by flatheads. A study of the rate of tree and stand deterioration in the marking of 26 trees has been undertaken by the Forest Insect Laboratory. Until more pertinent information is gained, it appears that the best policy to pursue is to treat the infestation annually to prevent a reinfestation of the stand.

REFERENCES

1. Carlson, S. T. "1939 Forest Insect Survey, Cleveland National." November 29, 1939.

2. Carlson, S. T. "Insect Control, Cleveland National Forest." February 27, 1940.

3. Keen, F. P. "Examination of Insect Conditions on Cleveland National Forest and Vicinity, San Diego County." January 5, 1926.

Photo No. 1. Immature stand of Jeffrey pine. Lagunas Area. New center of flathead infestation manifest here in 1939. These trees marked for observation. Photo by J.M.Miller April 1940.

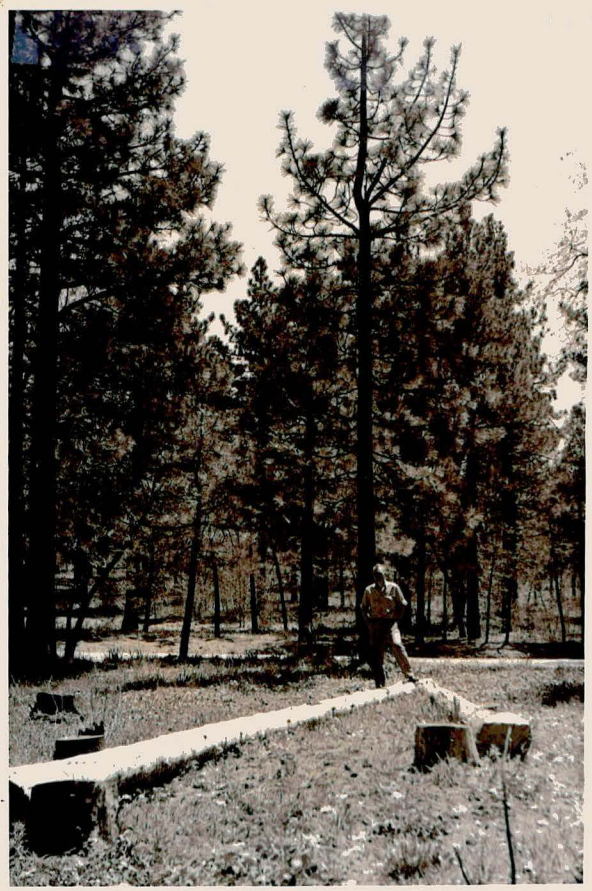

Photo No. 2. Jeffrey pine trees treated in 1940, opposite Lagunas Guard Station at Road Intersection. Note stumps from trees treated in previous infestation. Photo by J.M.Miller, April 1940.

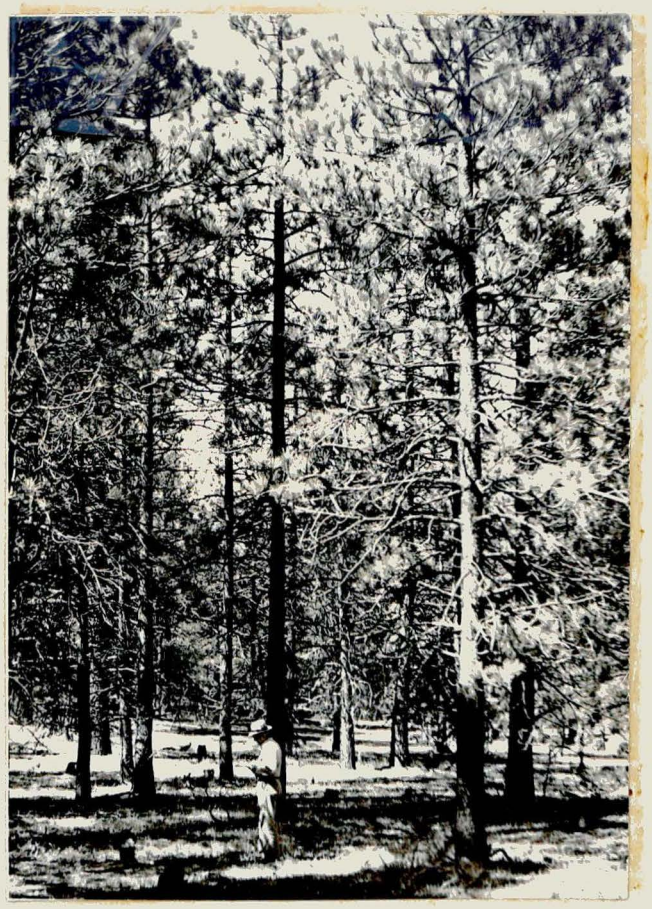

Photo No. 3. Sample area, Lagunas where trees have been marked for observation. Note stumps from treated trees. Photo by J.M.Miller, April 1940.

Photo No. 4. Flathead infestation of about 10 years duration in immature stand of Jeffrey pine, Lagunas Area. Note the large opening. Such losses in campgrounds and summer home sites seriously affect their use and desirability. Photo by J. M. Miller, April 1940.

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BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
FOREST INSECT LABORATORY - BERKELEY, CALIFORNIA

FOREST INSECT SURVEY

LAGUNAS INFESTATION AREA

SAN DIEGO COUNTY, CALIFORNIA

SAN BERNARDINO MERIDIAN

SCALE
In 0 ½ 1 2 3 4 Miles

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——— UNIT BOUNDARY

1939-40 Control Areas

CONTROL DATA

(December 1939 to March 1940)

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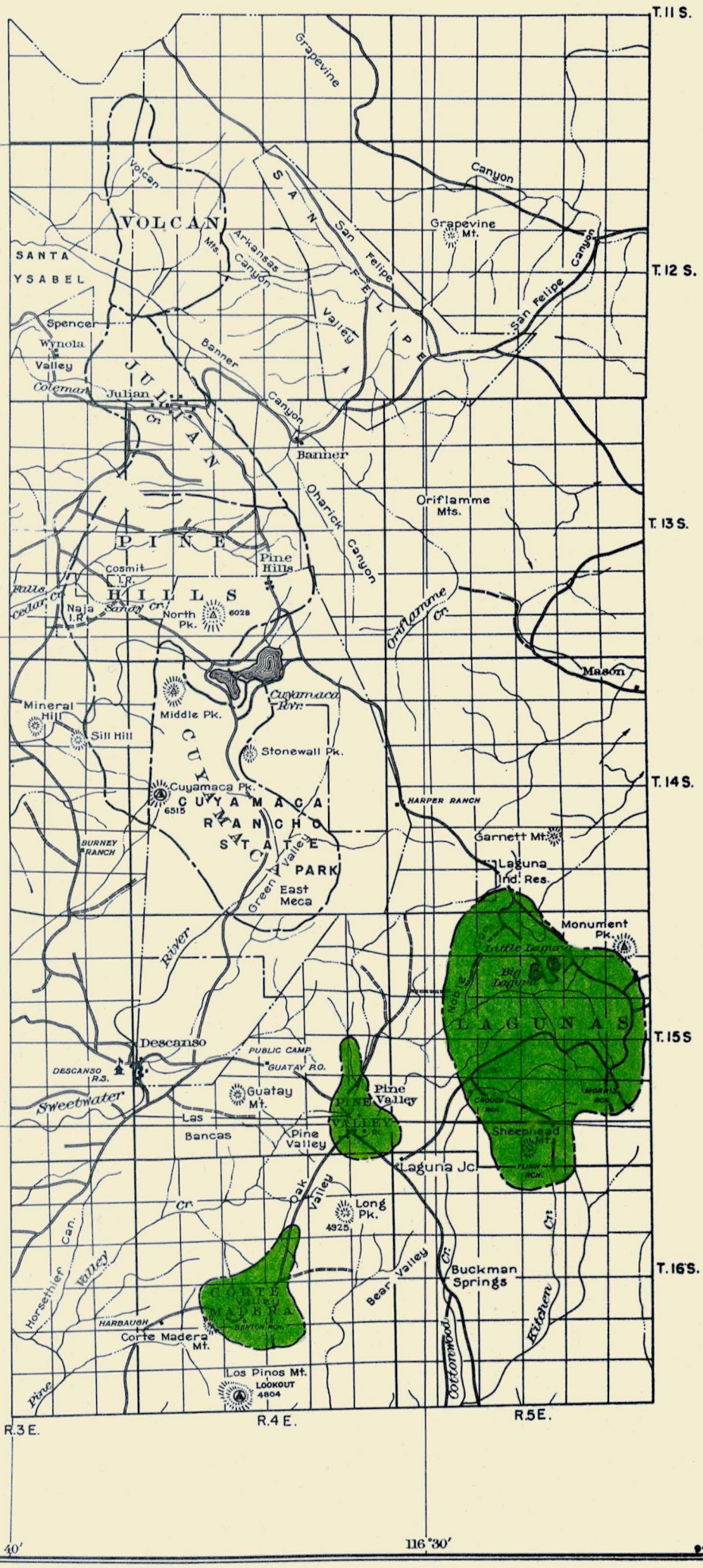

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